

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-17. (Canceled)

18. (Currently amended) A method for determining the rate of degradation of a nucleic acid biopolymer, comprising;

a) enriching a first sample nucleic acid biopolymer pool with stable isotope-labeled monomer;

b) collecting an aliquot of the first sample of nucleic acid biopolymer;

c) measuring the relative abundance of monoisotopic and isotopomeric peaks in the first sample;

d) collecting a second aliquot of the first sample of nucleic acid biopolymer;

e) measuring the relative abundance of monoisotopic and isotopomeric peaks in the second aliquot;

f) calculating the difference between the relative abundance of monoisotopic and isotopomeric peaks measured for the second sample and the first sample;

g) dividing the calculated difference between the relative abundance of monoisotopic and isotopomeric peaks by the time duration between the first and second aliquot and therefrom determining the rate of nucleic acid biopolymer degradation.

19. (Canceled)

20. (Currently amended) The method of claim 19 18, wherein the nucleic acid is a DNA, a complementary DNA, a ribosomal DNA, a RNA, a transfer RNA, a messenger RNA, or a nuclear RNA.

21. (Currently amended) The method of claim 18, wherein the stable isotope-labeled monomer is a deoxynucleic acid, or a ribonucleic acid, an amino acid, a sugar, or a fatty acid.

22. (Currently amended) The method of claim 18, wherein the nucleic acid biopolymer degradation is measured in an organism, an isolated cell, or a cell free system.

23. (Currently amended) The method of claim 18, wherein the nucleic acid biopolymer is separated to form a group of parent nucleic acid biopolymers.

24. (Currently amended) The method of claim 23, wherein the parent nucleic acid biopolymer is fragmented.

25. (Currently amended) The method of claim 24, wherein the nucleic acid biopolymer is fragmented by means of an enzyme, a chemical means, or physical stress.

26. (Currently amended) The method of claim 25, wherein the enzyme is a protease, a nuclease, or a lipase.

27.-28. (Canceled)

29. (Currently amended) The method of claim 18, wherein the relative abundance of monoisotopic and isotopomeric peaks are corrected for the synthesis of new nucleic acid biopolymer.

30. (Currently amended) The method of claim 29, wherein the relative abundance of newly synthesized nucleic acid biopolymer is determined in a second control sample which has been depleted of unlabeled monomer and incubated with stable isotope-labeled monomer for a time period sufficient for new nucleic acid biopolymer synthesis, the relative abundance of monoisotopic and isotopomeric peaks are determined at the time points used for

the first sample; and the difference between the relative abundance of monoisotopic and isotopomeric peaks from the first and second sample is determined.